

SYM76990VGGA-SP

System Board User's Manual

Chapter I - Introduction

Specifications

Processor	<ul style="list-style-type: none">• LGA 1155 socket for:<ul style="list-style-type: none">- 3rd generation Intel® Core™ processors (22nm process technology)<ul style="list-style-type: none">: Intel® Core™ i7-3770 (8M Cache, up to 3.9GHz); 77W: Intel® Core™ i5-3550S (6M Cache, up to 3.7GHz); 65W: Intel® Core™ i3-3220 (3M Cache, 3.3GHz); 55W: Intel® Pentium® G2120 (3M Cache, 3.1 GHz); 65W- 2nd generation Intel® Core™ processors (32nm process technology)<ul style="list-style-type: none">: Intel® Core™ i7-2600 (8M Cache, up to 3.8 GHz); 95W: Intel® Core™ i5-2400 (6M Cache, up to 3.4 GHz); 95W: Intel® Core™ i3-2120 (3M Cache, 3.3 GHz); 65W: Intel® Pentium® G850 (3M Cache, 2.9 GHz); 65W
Chipset	<ul style="list-style-type: none">• Intel® B65 PCH (Platform Controller Hub)
System Memory	<ul style="list-style-type: none">• Four 240-pin DDR3 DIMM sockets• Supports DDR3 1333/1600MHz (3rd generation processors)• Supports DDR3 1066/1333MHz (2nd generation processors)• Supports dual channel memory interface• Supports up to 32GB system memory• DRAM device technologies: 1Gb, 2GB and 4Gb DDR3 DRAM technologies are supported for x8 and x16 devices, unbuffered, non-ECC
Expansion Slots	<ul style="list-style-type: none">• 1 Mini PCIe x1 slot (PCIe 2.0)• 7 PCI slots(PCI 2.3: supports universal PCI card)
Graphics	<ul style="list-style-type: none">• Intel® HD Graphics• Display ports: DVI-I (DVI-D signal) and VGA• DVI-I supports up to 1920x1200 @ 60Hz resolution• VGA supports up to 2048x1536 @ 75Hz resolution• Supports 6 Graphics Execution Units (EUs)• Intel® Clear Video Technology• DirectX Video Acceleration (DXVA) support for accelerating video processing
Audio	<ul style="list-style-type: none">• Realtek ALC886 5.1-channel High Definition Audio• Audio outputs: Mic-in/Center+subwoofer, line-in/surround and line-out• S/PDIF audio interface
LAN	<ul style="list-style-type: none">• 2 Realtek RTL8111DL PCI Express Gigabit Ethernet controllers• Integrated 10/100/1000 transceiver• Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab• Supports wire management
Serial ATA	<ul style="list-style-type: none">• 6 Serial ATA ports<ul style="list-style-type: none">- 5 SATA 2.0 ports with data transfer rate up to 3Gb/s- 1 SATA 3.0 port with data transfer rate up to 6Gb/s• Integrated Advanced Host Controller Interface (AHCI) controller

TPM (optional)	<ul style="list-style-type: none"> • TPM - Trusted Platform Module • Provides a Trusted PC for secure transactions • Provides software license protection, enforcement and password protection
Rear Panel I/O Ports	<ul style="list-style-type: none"> • 1 mini-DIN-6 port for PS/2 mouse/keyboard • 2 DB-9 serial ports <ul style="list-style-type: none"> - Supports RS232/422/485 (RS232 and/or Power) • 1 DB-15 VGA port • 1 DVI-I port (DVI-D signal) • 2 RJ45 LAN ports • 6 USB 2.0/1.1 ports • Line-in/Surround, Line-out, Mic-in/Center+Subwoofer jacks
I/O Connectors	<ul style="list-style-type: none"> • 2 connectors for 4 external USB 2.0/1.1 ports • 4 connectors for 4 external RS232 serial ports • 1 SDVO connector for the optional SDVO-LVDS daughter-board • 1 8-bit Digital I/O connector • 1 front audio connector for line-out and mic-in jacks • 1 CD-in connector • 1 S/PDIF connector • 6 Serial ATA ports • 1 IDE connector • 1 24-pin ATX power connector • 1 8-pin 12V power connector • 1 chassis intrusion connector • 1 front panel connector • 3 fan connectors
BIOS	<ul style="list-style-type: none"> • AMI BIOS • 64Mbit SPI BIOS
Energy Efficient Design	<ul style="list-style-type: none"> • Supports ErP Lot6 power saving (optional) • Supports ACPI • System Power Management • Wake-On-Events include: <ul style="list-style-type: none"> - Wake-On-PS/2 KB/Mouse - Wake-On-USB KB/Mouse - Wake-On-LAN - RTC timer to power-on the system • CPU stopped clock control • AC power failure recovery
Damage Free Intelligence	<ul style="list-style-type: none"> • Monitors CPU/system temperature and overheat alarm • Monitors V_{CORE}/5V/3.3V/V_{DIMM}/12V/5V_{SB} voltages and failure alarm • Monitors CPU/system fan speed and failure alarm • Read back capability that displays temperature, voltage and fan speed • Watchdog timer function



Introduction

Temperature	<ul style="list-style-type: none">• Operating: 0°C to 60°C• Storage: -20°C to 85°C
Humidity	<ul style="list-style-type: none">• 10% to 90%
PCB	<ul style="list-style-type: none">• ATX form factor• 305mm (12") x 244mm (9.6")

Features

Watchdog Timer

The Watchdog Timer function allows your application to regularly “clear” the system at the set time interval. If the system hangs or fails to function, it will reset at the set time interval so that your system will continue to operate.

DDR3

DDR3 delivers increased system bandwidth and improved performance. It offers peak data transfer rate of up to 21 Gb/s bandwidth. The advantages of DDR3 are its higher bandwidth and its increase in performance at a lower power than DDR2.

Graphics

The integrated Intel HD graphics for graphics intensive applications delivers exceptional 3D, 2D and video capabilities. It supports VGA and DVI interfaces.

DVI

DVI (Digital Visual Interface) is a form of video interface technology made to maximize the quality of flat panel LCD monitors and modern video graphics cards. Data is transmitted using the TMDS (Transition Minimized Differential Signaling) protocol, providing a digital signal from the PC’s graphics subsystem to the display.

PCI Express

PCI Express is a high bandwidth I/O infrastructure that possesses the ability to scale speeds by forming multiple lanes. The x4 PCI Express lane supports transfer rate of 1 Gigabyte per second. The PCI Express architecture also provides a high performance graphics infrastructure by enhancing the capability of a x16 PCI Express lane to provide 8 Gigabytes per second transfer rate.

Audio

The Realtek ALC886 audio codec provides 5.1-channel High Definition audio output.

Serial ATA

Serial ATA is a storage interface that is compliant with SATA 1.0a specification. SATA 3.0 supports speed up to 6Gb/s while SATA 2.0 supports speed up to 3Gb/s. This improves hard drive performance faster than the standard parallel ATA whose data transfer rate is 100MB/s.

Gigabit LAN

The Realtek RTL8111DL PCI Express Gigabit Ethernet controller supports up to 1Gbps data transmission.

USB

The system board supports USB 2.0 and USB 1.1 ports. USB 1.1 supports 12Mb/second bandwidth while USB 2.0 supports 480Mb/second bandwidth providing a marked improvement in device transfer speeds between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

Wake-On-LAN

This feature allows the network to remotely wake up a Soft Power Down (Soft-Off) PC. It is supported via the onboard LAN port or via a PCI LAN card that uses the PCI PME (Power Management Event) signal. However, if your system is in the Suspend mode, you can power-on the system only through an IRQ or DMA interrupt.

**Important:**

The +5V_standby power source of your power supply must support $\geq 720\text{mA}$.

Wake-On-PS/2

This function allows you to use the PS/2 keyboard or PS/2 mouse to power-on the system.

**Important:**

The +5V_standby power source of your power supply must support $\geq 720\text{mA}$.

Wake-On-USB

This function allows you to use a USB keyboard or USB mouse to wake up a system from the S3 (STR - Suspend To RAM) state.

**Important:**

If you are using the Wake-On-USB Keyboard/Mouse function for 2 USB ports, the +5V_standby power source of your power supply must support $\geq 1.5\text{A}$. For 3 or more USB ports, the +5V_standby power source of your power supply must support $\geq 2\text{A}$.

RTC Timer

The RTC installed on the system board allows your system to automatically power-on on the set date and time.

ACPI STR

The system board is designed to meet the ACPI (Advanced Configuration and Power Interface) specification. ACPI has energy saving features that enables PCs to implement Power Management and Plug-and-Play with operating systems that support OS Direct Power Management. ACPI when enabled in the Power Management Setup will allow you to use the Suspend to RAM function.

With the Suspend to RAM function enabled, you can power-off the system at once by pressing the power button or selecting "Standby" when you shut down Windows® without having to go through the sometimes tiresome process of closing files, applications and operating system. This is because the system is capable of storing all programs and data files during the entire operating session into RAM (Random Access Memory) when it powers-off. The operating session will resume exactly where you left off the next time you power-on the system.

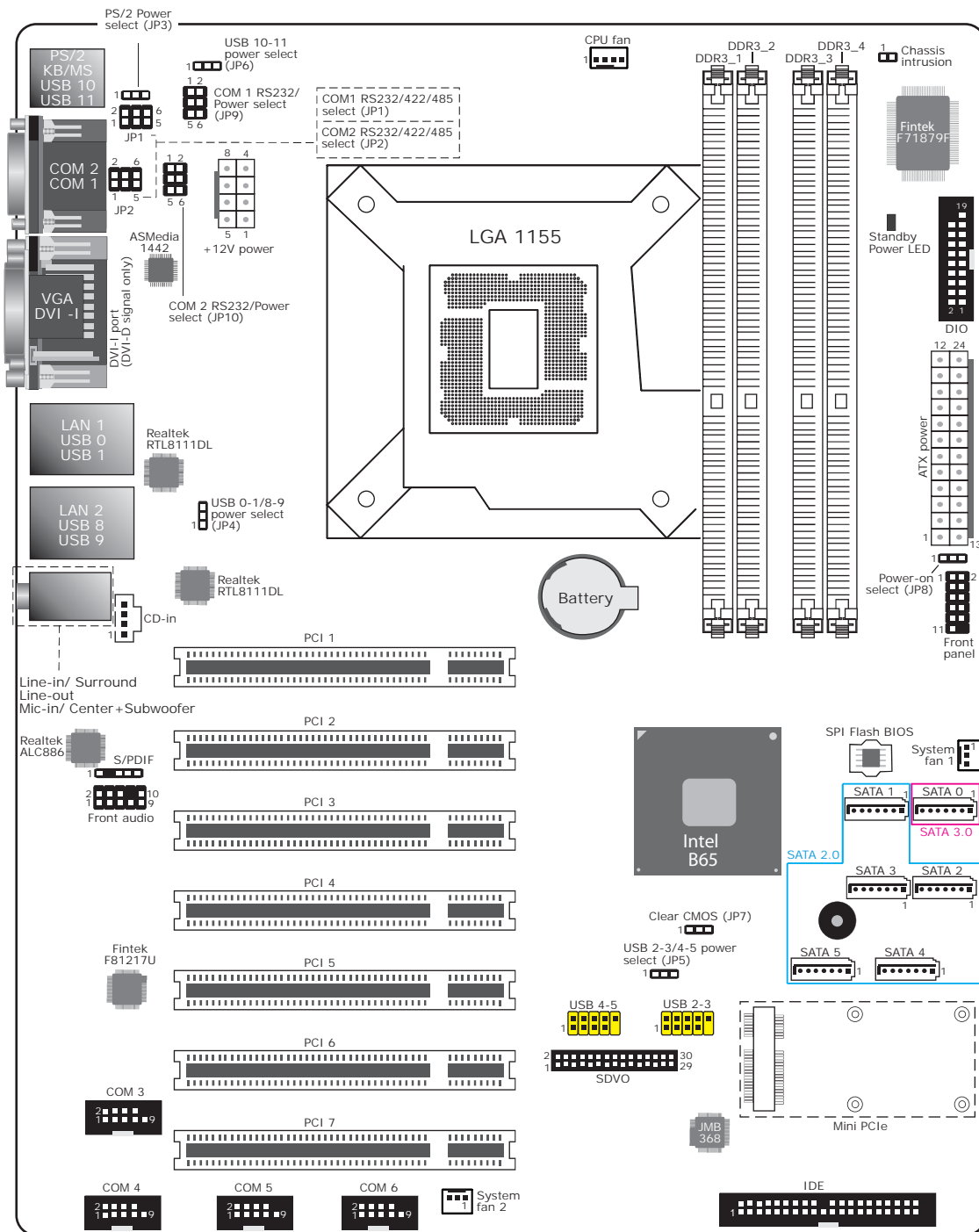


Important:

The +5V_standby power source of your power supply must support $\geq 720\text{mA}$.

Power Failure Recovery

When power returns after an AC power failure, you may choose to either power-on the system manually or let the system power-on automatically.



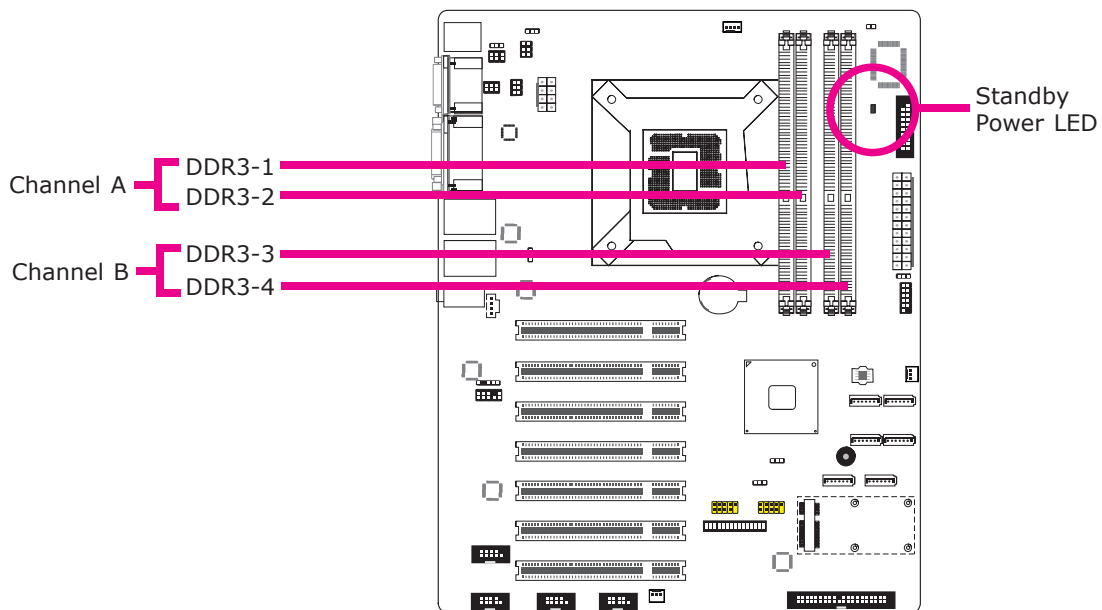
**Important:**

Electrostatic discharge (ESD) can damage your system board, processor, disk drives, add-in boards, and other components. Perform the upgrade instruction procedures described at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.

System Memory

**Important:**

When the Standby Power LED lit red, it indicates that there is power on the system board. Power-off the PC then unplug the power cord prior to installing any devices. Failure to do so will cause severe damage to the motherboard and components.



Features

- The four DIMM sockets are divided into 2 channels:
Channel A - DDR3_1 and DDR3_2
Channel B - DDR3_3 and DDR3_4
- Dual channel memory interface
- Maximum of 32GB system memory

The system board supports the following memory interface.

Single Channel (SC)

Data will be accessed in chunks of 64 bits (8B) from the memory channels.

Dual Channel (DC)

Data will be accessed in chunks of 128 bits from the memory channels. Dual channel provides better system performance because it doubles the data transfer rate.

Single Channel	<p>DIMMs are on the same channel.</p> <p>DIMMs in a channel can be identical or completely different. However, we highly recommend using identical DIMMs.</p> <p>Not all slots need to be populated.</p>
Dual Channel	<p>DIMMs of the same memory configuration are on different channels.</p>



Important:

1. You can populate either Channel A or Channel B first.
2. When installing a DIMM in Channel A or Channel B, always populate the socket that is farthest the CPU. In this case, it will mean populating DDR3-2 and/or DDR3-4 first.
3. If you intend to use dual channel, the same rule applies - always the socket farthest the CPU. Populate DDR3-2 and/or DDR3-4 first; not DDR3-2 and DDR3-3 and not DDR3-1 and DDR3-4.

Installing the DIM Module

**Note:**

The system board used in the following illustrations may not resemble the actual board. These illustrations are for reference only.

1. Make sure the PC and all other peripheral devices connected to it has been powered down.
2. Disconnect all power cords and cables.
3. Locate the DIMM socket on the system board.
4. Push the “ejector tabs” which are at the ends of the socket to the side.

Ejector tab



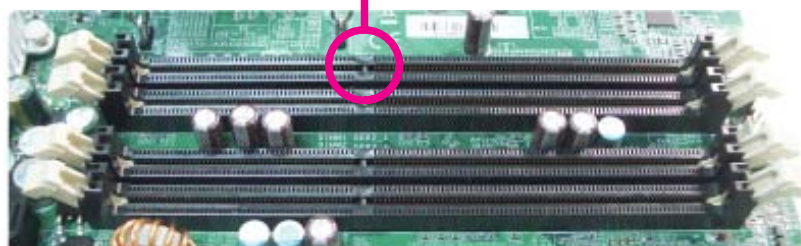
Ejector tab

5. Note how the module is keyed to the socket.



Notch

Key



6. Grasping the module by its edges, position the module above the socket with the “notch” in the module aligned with the “key” on the socket. The keying mechanism ensures the module can be plugged into the socket in only one way.



7. Seat the module vertically, pressing it down firmly until it is completely seated in the socket.



8. The ejector tabs at the ends of the socket will automatically snap into the locked position to hold the module in place.



CPU

The system board is equipped with a surface mount LGA 1155 socket. This socket is exclusively designed for installing a LGA 1155 packaged Intel CPU.



Important:

1. Before you proceed, make sure (1) the LGA 1155 socket comes with a protective cap, (2) the cap is not damaged and (3) the socket's contact pins are not bent. If the cap is missing or the cap and/or contact pins are damaged, contact your dealer immediately.
2. Make sure to keep the protective cap. RMA requests will be accepted and processed only if the LGA 1155 socket comes with the protective cap.



Note:

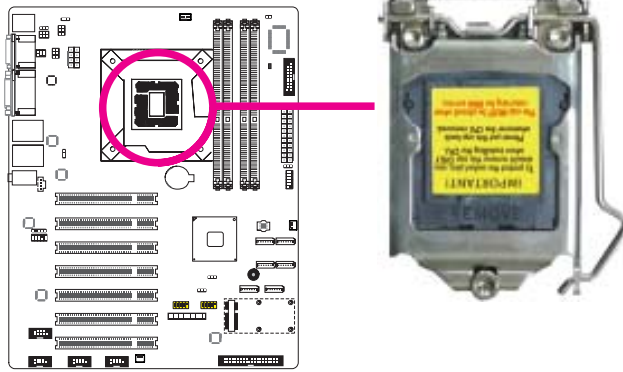
The system board used in the following illustrations may not resemble the actual board. These illustrations are for reference only.

Installing the CPU

1. Make sure the PC and all other peripheral devices connected to it has been powered down.
2. Disconnect all power cords and cables.
3. Locate the LGA 1155 CPU socket on the system board.

Important:

The CPU socket must not come in contact with anything other than the CPU. Avoid unnecessary exposure. Remove the protective cap only when you are about to install the CPU.

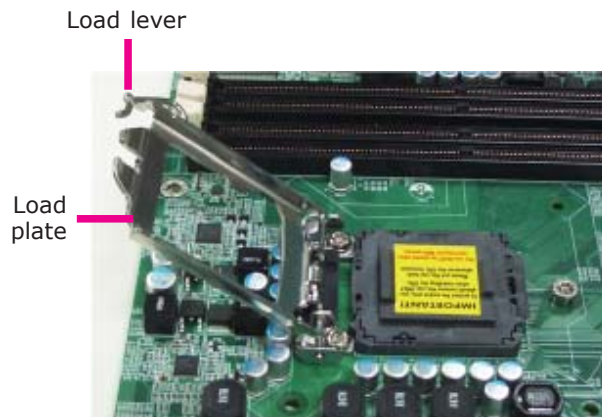


4. Unlock the socket by pushing the load lever down, moving it sideways until it is released from the retention tab; then lift the load lever up.

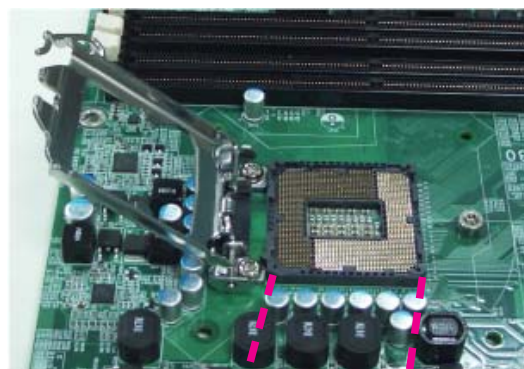


- Lifting the load lever will at the same time lift the load plate.

Lift the load lever up to the angle shown on the photo.

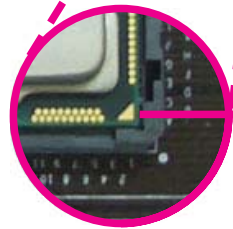


- Remove the protective cap from the CPU socket. The cap is used to protect the CPU socket against dust and harmful particles. Remove the protective cap only when you are about to install the CPU.



Protective cap

7. Insert the CPU into the socket. The gold triangular mark on the CPU must align with the corner of the CPU socket shown on the photo.



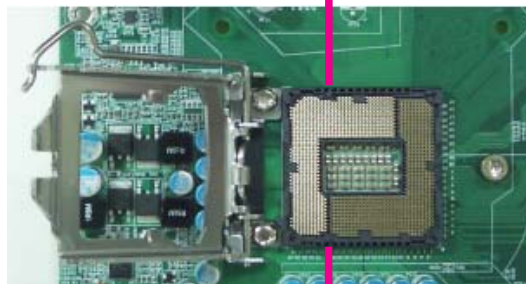
Gold triangular mark

The CPU's notch will at the same time fit into the socket's alignment key.

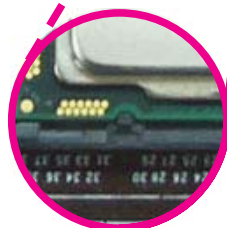
Important:

The CPU will fit in only one orientation and can easily be inserted without exerting any force.

Alignment key



Alignment key



8. Close the load plate then push the load lever down.

While closing the load plate, make sure the front edge of the load plate slides under the retention knob.



Retention knob

9. Hook the load lever under the retention tab.



Load lever

Retention tab

Installing the Fan and Heat Sink

The CPU must be kept cool by using a CPU fan with heat sink. Without sufficient air circulation across the CPU and heat sink, the CPU will overheat damaging both the CPU and system board.



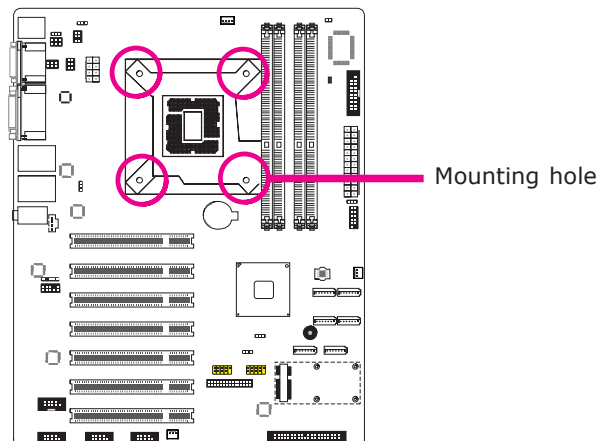
Note:

A boxed Intel® processor already includes the CPU fan and heat sink assembly. If your CPU was purchased separately, make sure to only use Intel®-certified fan and heat sink.

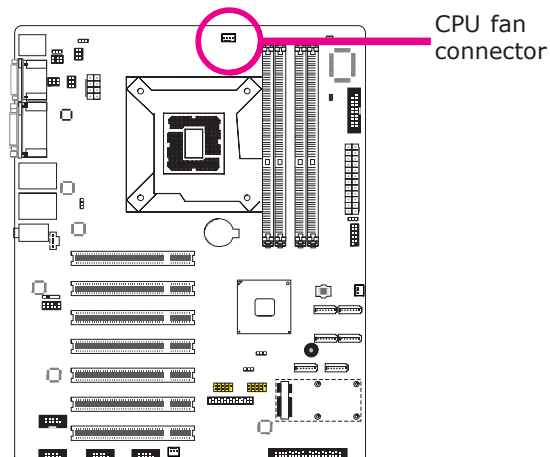
1. Before you install the fan / heat sink, you must apply a thermal paste onto the top of the CPU. The thermal paste is usually supplied when you purchase the fan / heat sink assembly. Do not spread the paste all over the surface. When you later place the heat sink on top of the CPU, the compound will disperse evenly.

Some heat sinks come with a patch of pre-applied thermal paste. Do not apply thermal paste if the fan / heat sink already has a patch of thermal paste on its underside. Peel the strip that covers the paste before you place the fan / heat sink on top of the CPU.

2. Place the heat sink on top of the CPU. The 4 push-pins around the heat sink, which are used to secure the heat sink onto the system board, must match the 4 mounting holes around the socket.

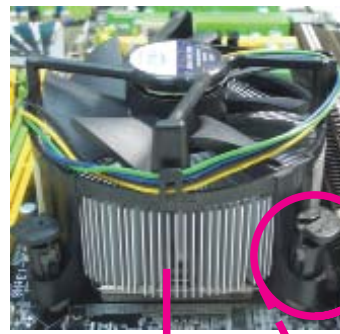


3. Orient the heat sink such that the CPU fan's cable is nearest the CPU fan connector.



4. Rotate each push-pin according to the direction of the arrow shown on top of the pin.

Push down two pushpins that are diagonally across the heat sink. Perform the same procedure for the other two push-pins.



Heat sink

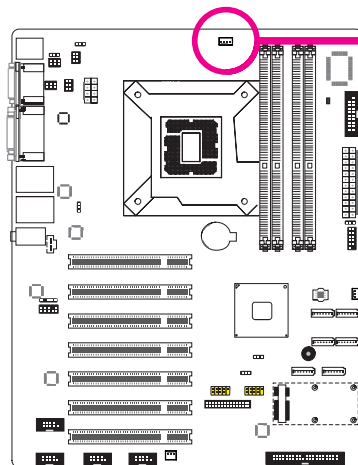


"Locked" position of push-pin



"Unlocked" position of push-pin

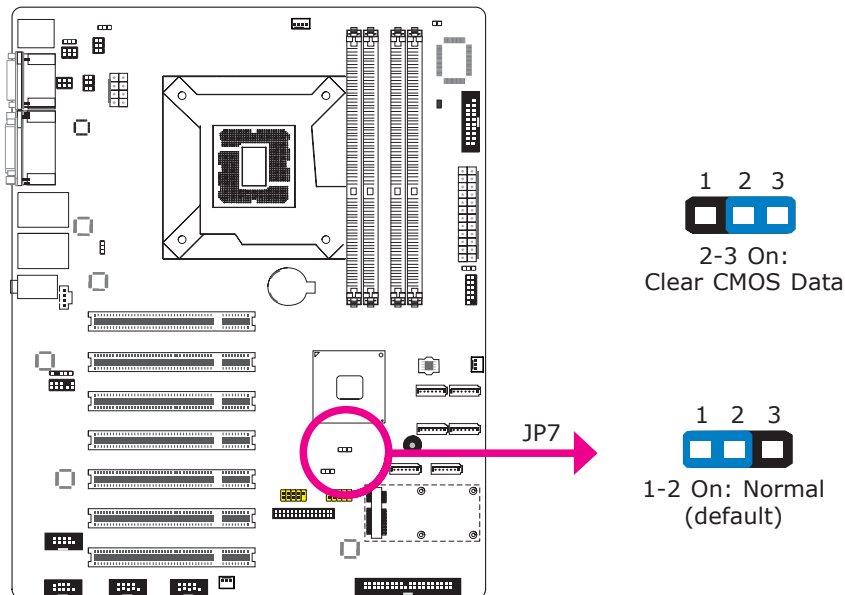
5. Connect the CPU fan's cable to the CPU fan connector on the system board.



CPU fan connector

Jumper Settings

Clear CMOS Data



If you encounter the following,

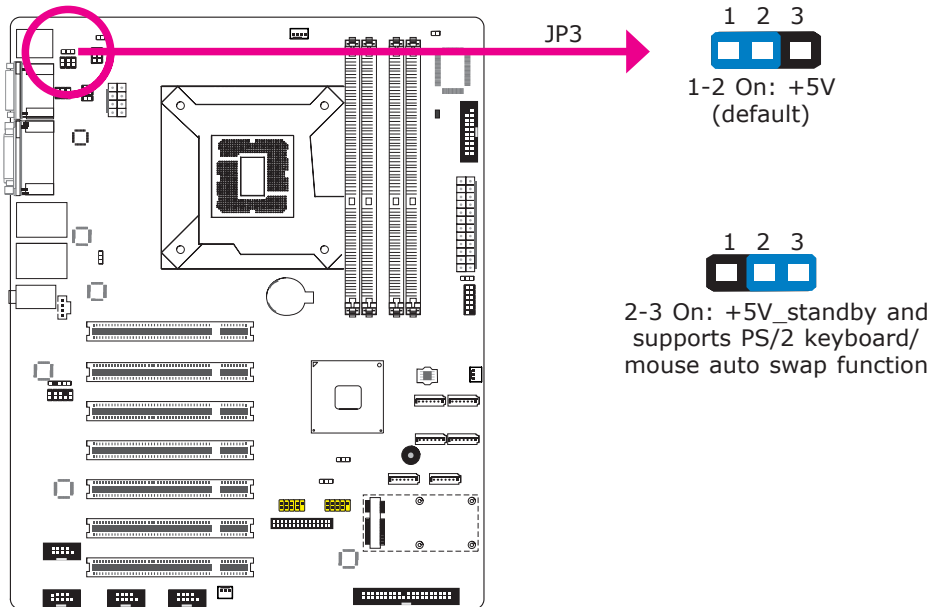
- CMOS data becomes corrupted.
- You forgot the supervisor or user password.

you can reconfigure the system with the default values stored in the ROM BIOS.

To load the default values stored in the ROM BIOS, please follow the steps below.

- Power-off the system and unplug the power cord.
- Set JP7 pins 2 and 3 to On. Wait for a few seconds and set JP7 back to its default setting, pins 1 and 2 On.
- Now plug the power cord and power-on the system.

PS/2 Power Select



JP3 is used to select the power of the PS/2 keyboard and PS/2 mouse ports. Selecting +5V_standby will allow you to use the PS/2 keyboard or PS/2 mouse to wake up the system.



Important:

The +5V_standby power source of your power supply must support $\geq 720\text{mA}$.



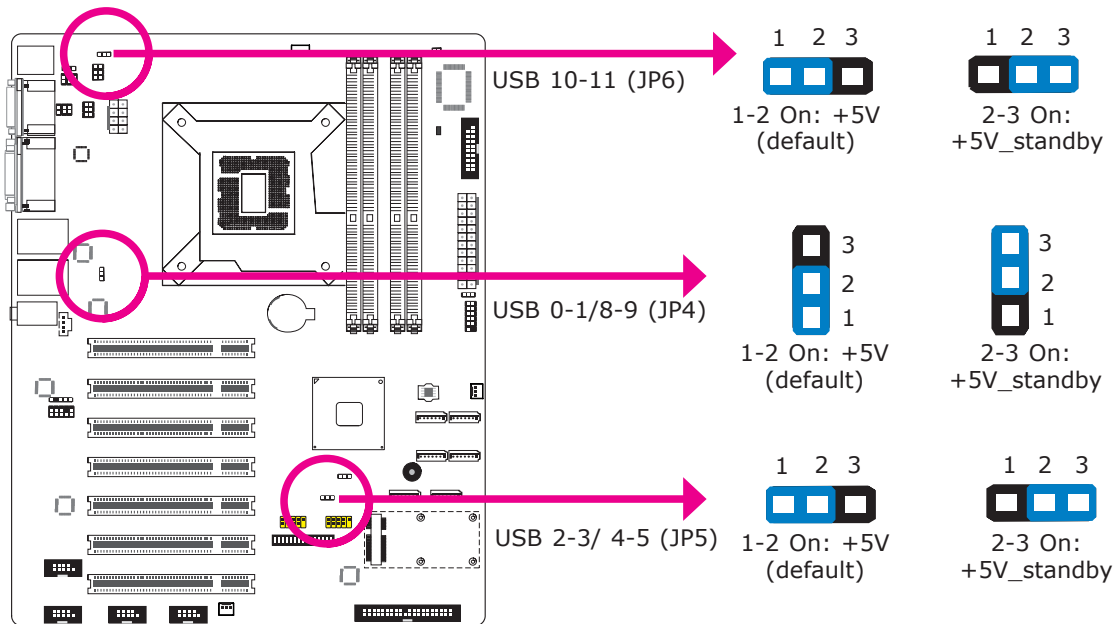
Important:

If you are using the Wake-On-USB Keyboard/Mouse function for 2 USB ports, the +5V_standby power source of your power supply must support $\geq 1.5\text{A}$. For 3 or more USB ports, the +5V_standby power source of your power supply must support $\geq 2\text{A}$.

By default, the PS/2 port supports PS/2 keyboard only. If you intend to connect a PS/2 mouse, you must set JP3 to 2-3 On. This will support the auto-swap function allowing the system to auto-detect the PS/2 device.

To allow the system to detect devices that may be incorrectly plugged to the wrong port on the cable, set JP3 to 2-3 On. Setting JP3 to 2-3 On will enable the auto-swap function allowing you to use the devices without having to replug the devices.

USB Power Select



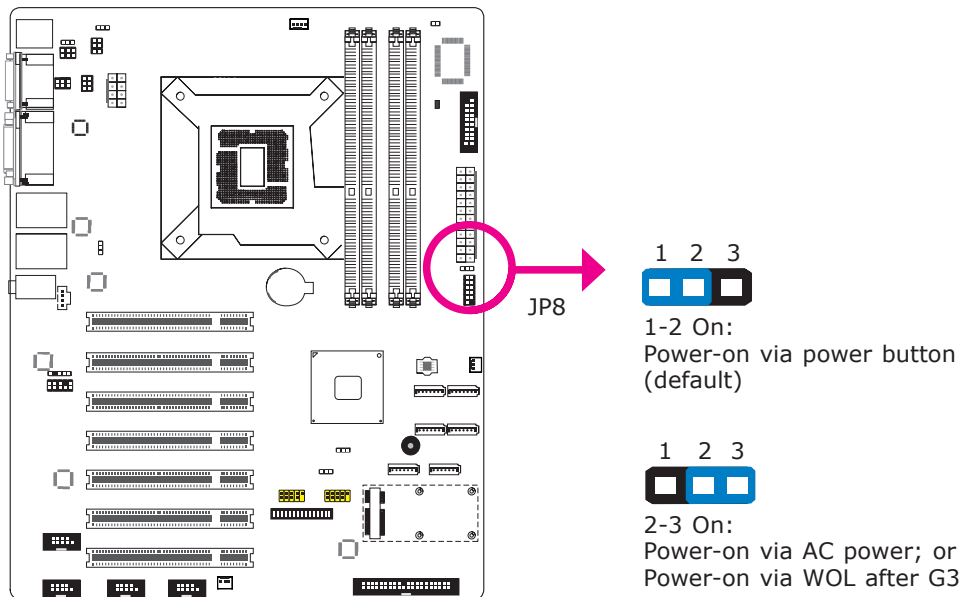
These jumpers are used to select the power of the USB ports. Selecting +5V_standby will allow you to use a USB device to wake up the system.



Important:

If you are using the Wake-On-USB Keyboard/Mouse function for 2 USB ports, the +5V_standby power source of your power supply must support $\geq 1.5A$. For 3 or more USB ports, the +5V_standby power source of your power supply must support $\geq 2A$.

Power-on Select



To power-on via WOL after G3:

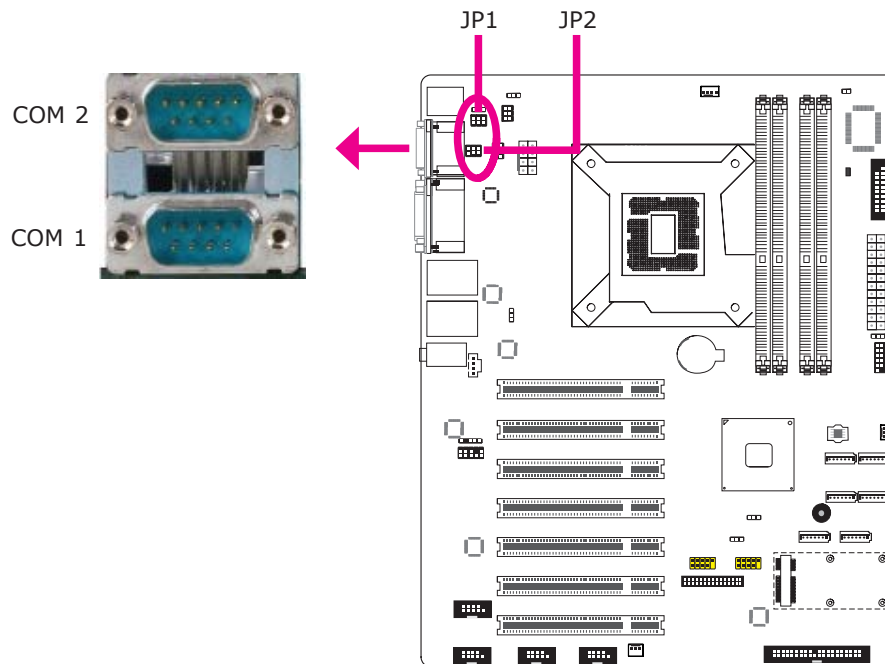
1. Set JP8 pins 2 and 3 to On.
2. Set the "After G3" field to **Power Off/WOL**.
3. Set the "GbE Wake Up From S5" to **Enabled**.

The BIOS fields are in the "South Bridge Configuration" submenu (Chipset menu) of the AMI BIOS utility.

To power-on via AC Power:

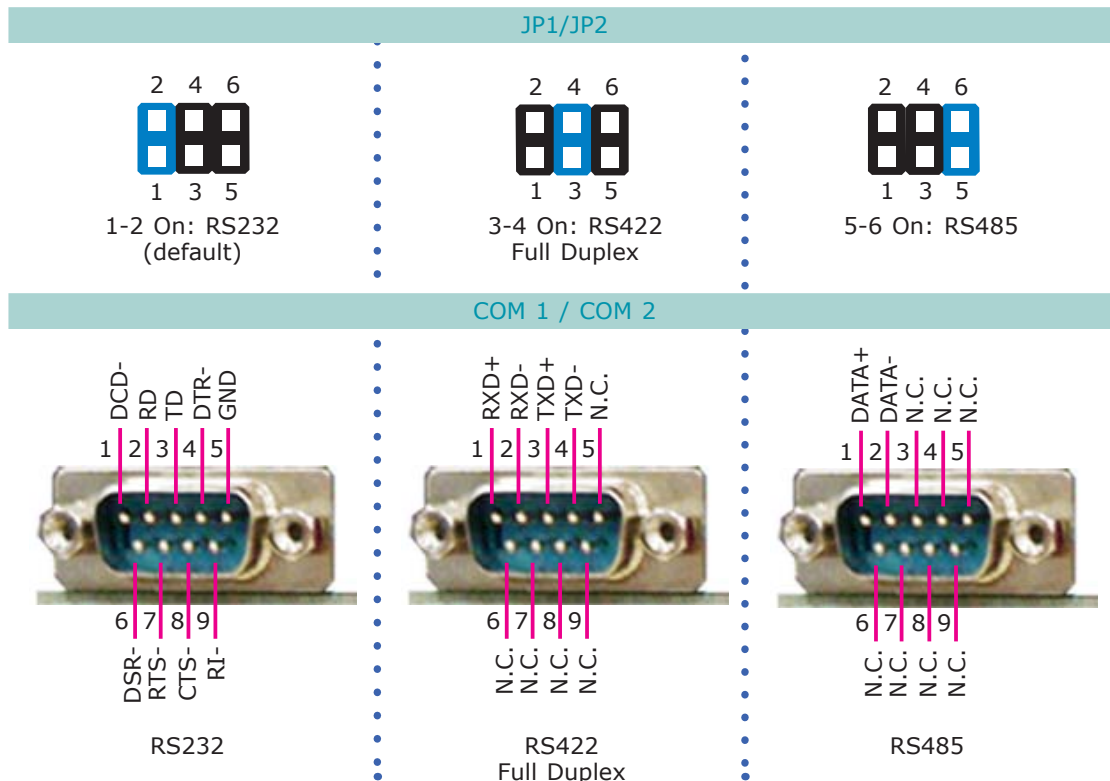
1. Set JP8 pins 2 and 3 to On.
2. Set the "After G3" field to **Power On**.

COM1/COM2 RS232/RS422/RS485 Select

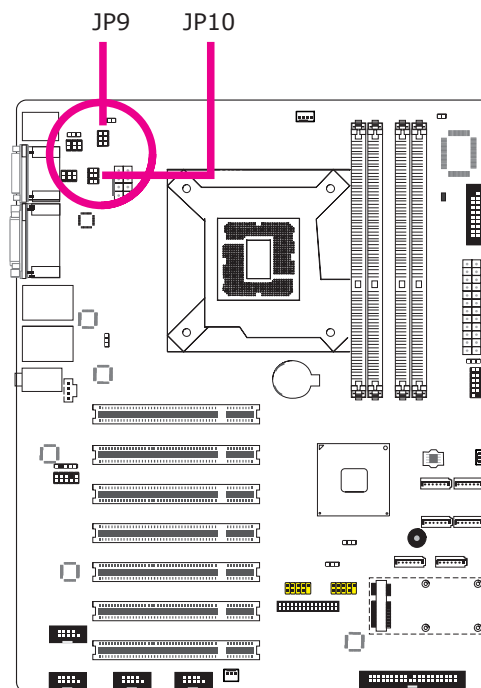





JP1 (for COM1) and JP2 (for COM2) are used to configure the COM ports to RS232, RS422 (Full Duplex) or RS485.




The pin function of the COM ports will vary according to the jumper's setting.



COM1/COM2 RS232/Power Select



1		2	1-3 (RI), 2-4 (DCD) On:
3		4	RS232 (default)
5		6	

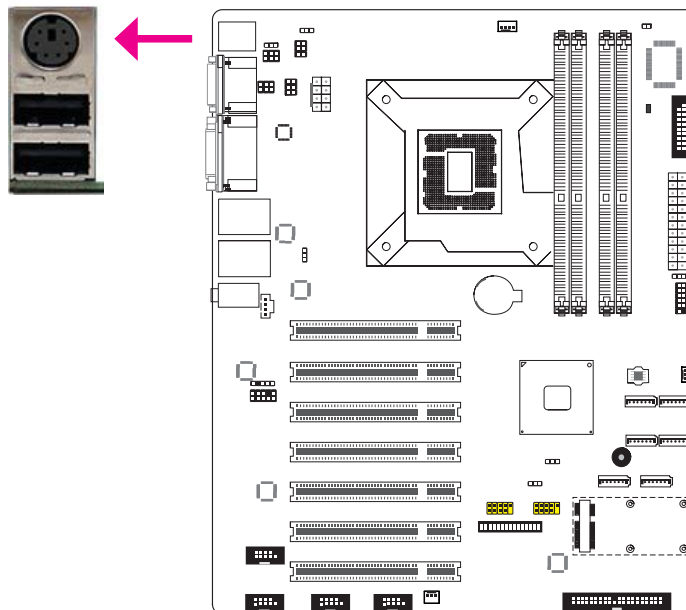
1		2	3-5 (+5V), 4-6 (+12V) On:
3		4	RS232 with power
5		6	



The rear panel I/O ports consist of the following:

- PS/2 mouse/ keyboard port
- 2 COM ports
- VGA port
- DVI-I port (DVI-D signal only)
- 2 LAN ports
- 6 USB ports
- Mic-in/ Center+subwoofer jack
- Line-out jack
- Line-in/ Surround jack

PS/2 Keyboard/
Mouse



The PS/2 port is used to connect a PS/2 keyboard and a PS/2 mouse by means of the provided cable.

Wake-On-PS/2 Keyboard/ Mouse

The Wake-On-PS/2 Keyboard/ Mouse function allows you to use the PS/2 keyboard or PS/2 mouse to power-on the system. To use this function:

- Jumper Setting

JP3 must be set to "2-3 On: +5V_standby". Refer to "PS/2 Power Select" in this chapter for more information.

- BIOS Setting

Configure the PS/2 keyboard/mouse wake up function in the Advanced menu ("ACPI Power Management Configuration" submenu) of the BIOS. Refer to chapter 3 for more information.



Important:

The +5V_standby power source of your power supply must support $\geq 720\text{mA}$.

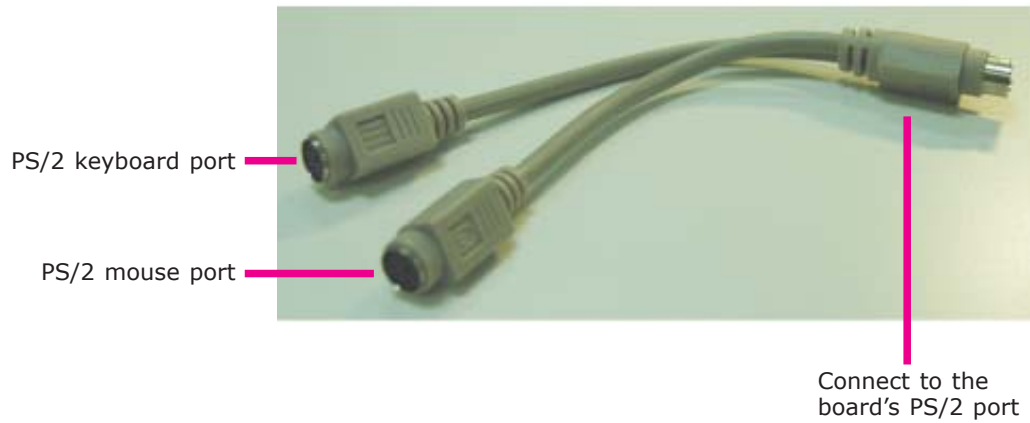
Make sure to turn off your computer prior to connecting or disconnecting a mouse or keyboard. Failure to do so may damage the system board.



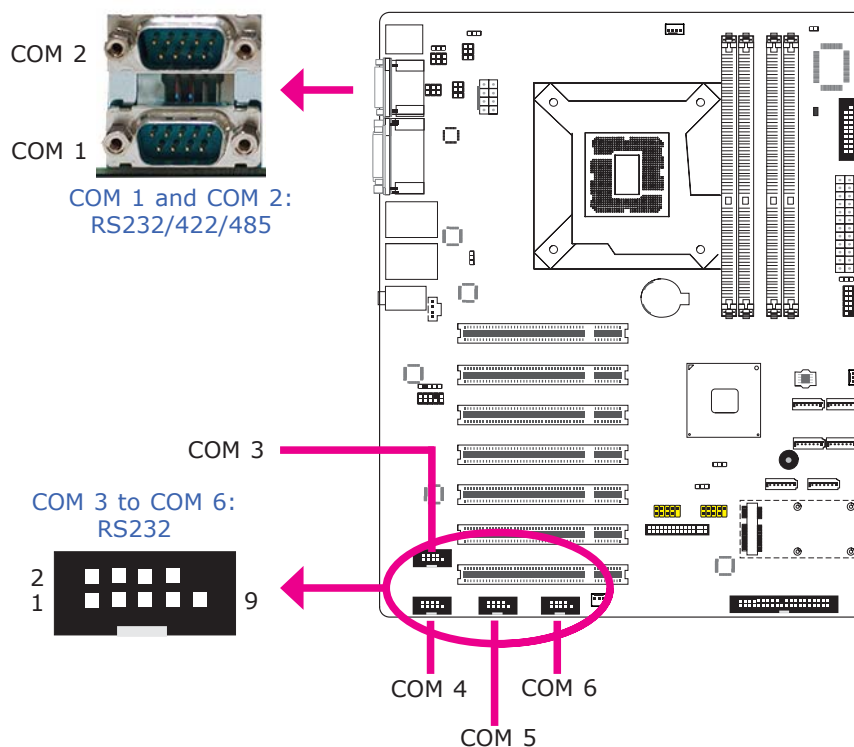
Important:

By default, the PS/2 port supports PS/2 keyboard only. If you intend to connect a PS/2 mouse, you must set JP3 to 2-3 On. This will support the auto-swap function allowing the system to auto-detect the PS/2 device.

To allow the system to detect devices that may be incorrectly plugged to the wrong port on the cable, set JP3 to 2-3 On. Setting JP3 to 2-3 On will enable the auto-swap function allowing you to use the devices without having to replug the devices.



COM (Serial) Ports



COM 3 to COM 6 are fixed at RS232.

The pin function of COM 1 and COM 2 ports will vary according to JP1/JP2's setting. Refer to "COM1/COM2 RS232/RS422/RS485 Select" in this chapter for more information.

The serial ports are asynchronous communication ports with 16C550A-compatible UARTs that can be used with modems, serial printers, remote display terminals, and other serial devices.

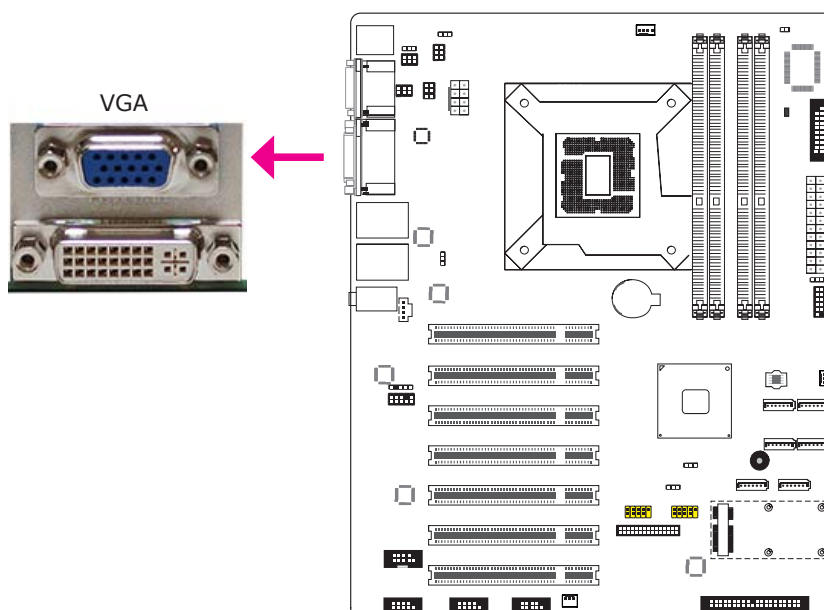
Connecting External Serial Ports

Your COM port may come mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then insert the serial port cable to the COM connector. Make sure the colored stripe on the ribbon cable is aligned with pin 1 of the COM connector.

BIOS Setting

Configure the serial ports in the Advanced menu ("Super IO Configuration" sub-menu) of the BIOS. Refer to chapter 3 for more information.

VGA Port



The VGA port is used for connecting a VGA monitor. Connect the monitor's 15-pin D-shell cable connector to the VGA port. After you plug the monitor's cable connector into the VGA port, gently tighten the cable screws to hold the connector in place.

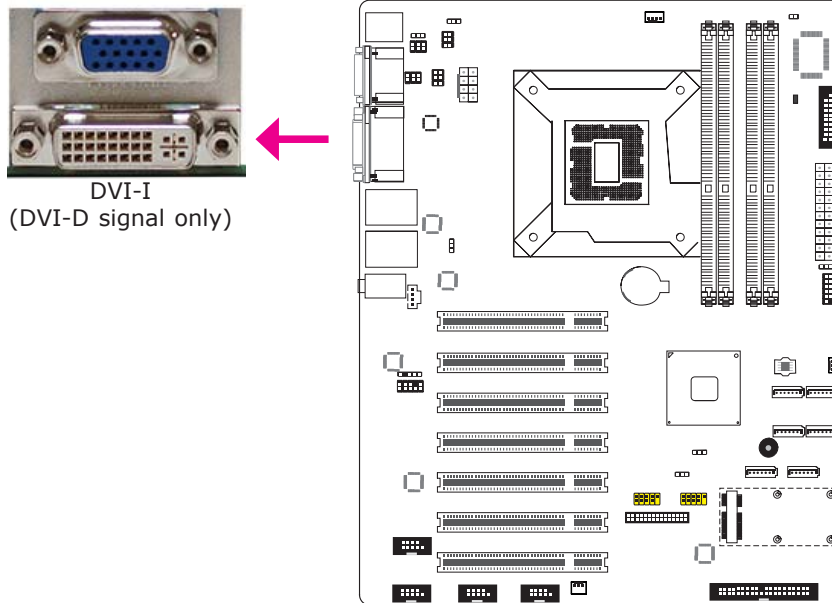
BIOS Setting

Configure VGA in the Chipset menu ("North Bridge Configuration" submenu) of the BIOS. Refer to chapter 3 for more information.

Driver Installation

Install the graphics driver. Refer to chapter 4 for more information.

DVI-I Port

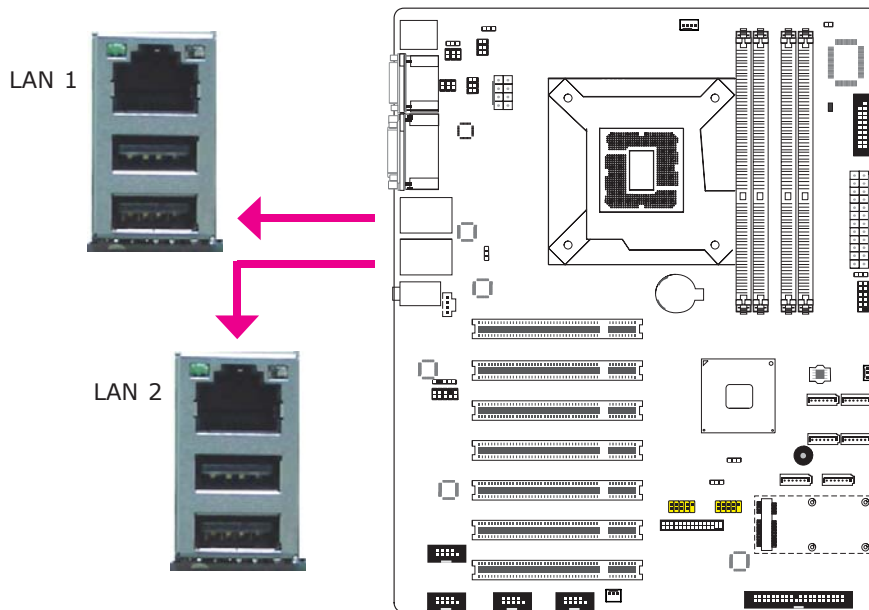


The DVI-I port is used to connect an LCD monitor. This port supports DVI-D signal only.

Connect the display device's cable connector to the DVI-I port. After you plug the cable connector into the port, gently tighten the cable screws to hold the connector in place.

BIOS Setting

Configure the display device in the Chipset menu ("North Bridge Configuration" submenu) of the BIOS. Refer to chapter 3 for more information.



Features

- Realtek RTL8111DL PCI Express Gigabit Ethernet controller

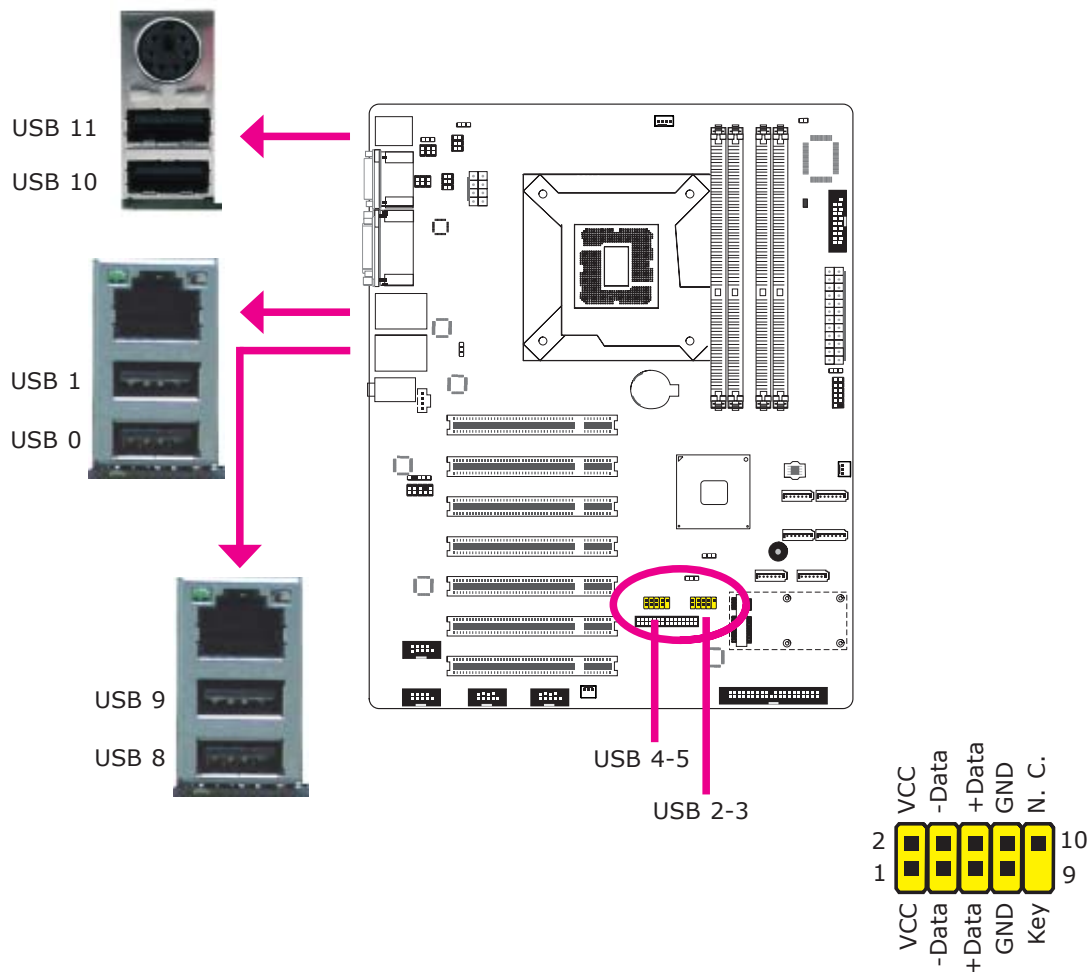
The LAN ports allow the system board to connect to a local area network by means of a network hub.

BIOS Setting

Configure the onboard LAN in the Chipset menu ("South Bridge Configuration" submenu) of the BIOS. Refer to chapter 3 for more information.

Driver Installation

Install the LAN drivers. Refer to chapter 4 for more information.



USB allows data exchange between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

The system board is equipped with four onboard USB 2.0/1.1 ports. The four 10-pin connectors allow you to connect 8 additional USB 2.0/1.1 ports. The additional USB ports may be mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis and then insert the USB port cables to a connector.

BIOS Setting

Configure the onboard USB in the Advanced menu ("USB Configuration" sub-menu) of the BIOS. Refer to chapter 3 for more information.

Driver Installation

You may need to install the proper drivers in your operating system to use the USB device. Refer to your operating system's manual or documentation for more information.

The Wake-On-USB Keyboard/Mouse function allows you to use a USB keyboard or USB mouse to wake up a system from the S3 (STR - Suspend To RAM) state. To use this function:

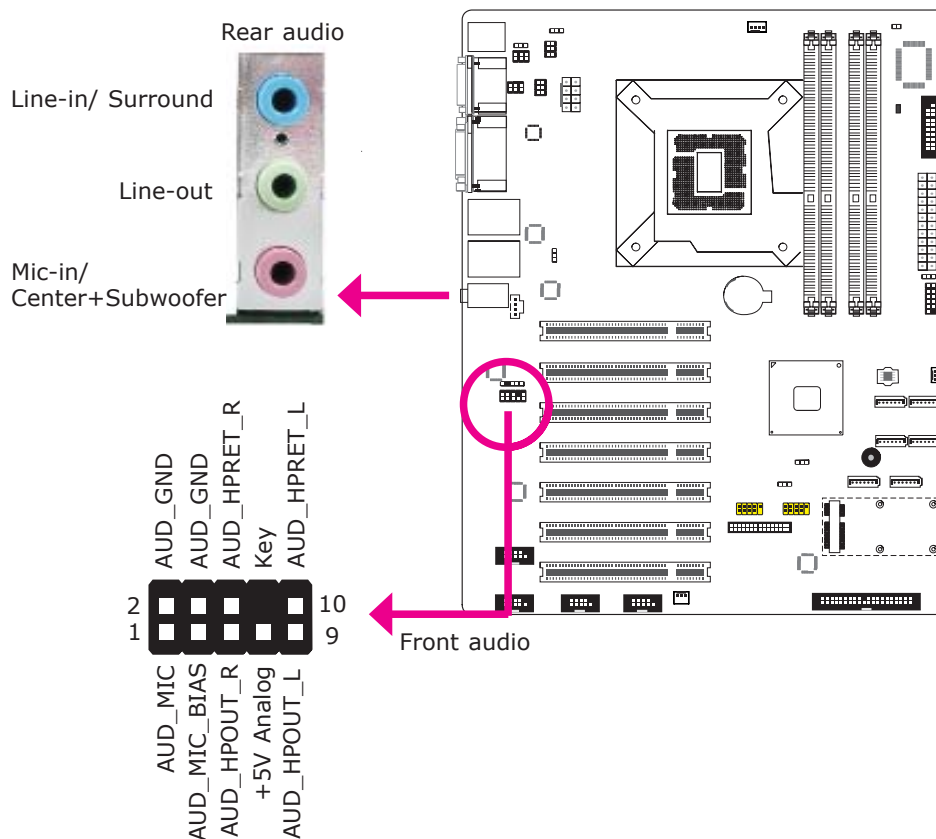
- Jumper Setting

JP4, JP5 and/or JP6 must be set to "2-3 On: +5V_standby". Refer to "USB Power Select" in this chapter for more information.



Important:

If you are using the Wake-On-USB Keyboard/Mouse function for 2 USB ports, the +5V_standby power source of your power supply must support $\geq 1.5A$. For 3 or more USB ports, the +5V_standby power source of your power supply must support $\geq 2A$.




The system board is equipped with 3 audio jacks. A jack is a one-hole connecting interface for inserting a plug.

- Mic-in/ Center+Subwoofer Jack (Pink)
This jack is used to connect an external microphone or to the center and subwoofer speakers of the audio system.
- Line-in/ Surround Jack (Light Blue)
This jack is used to connect any audio devices such as Hi-fi set, CD player, tape player, AM/FM radio tuner, synthesizer, etc.
- Line-out Jack (Lime)
This jack is used to connect a headphone or external speakers.

Front Audio

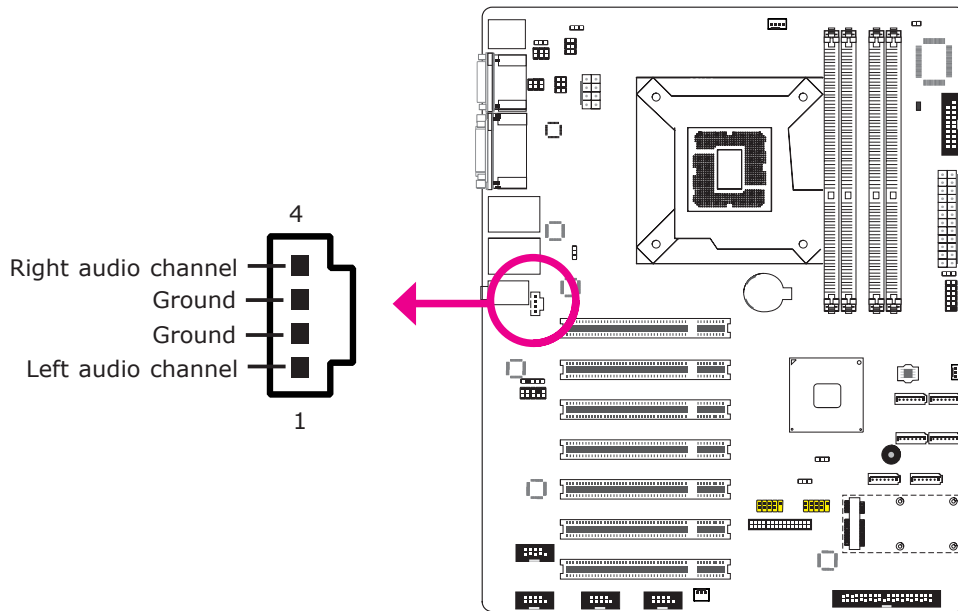
The front audio connector allows you to connect to the second line-out and mic-in jacks that are at the front panel of your system.



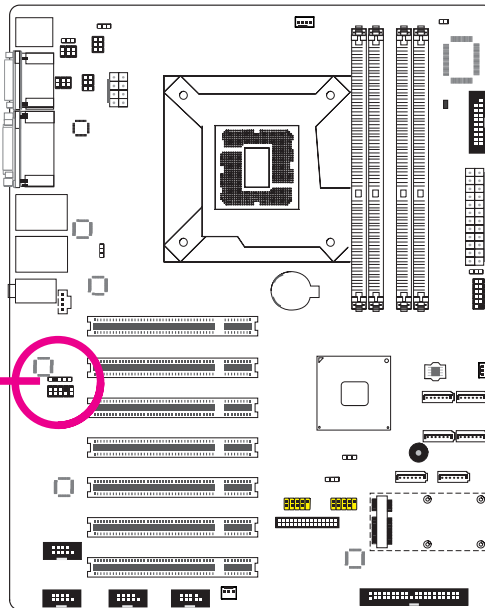
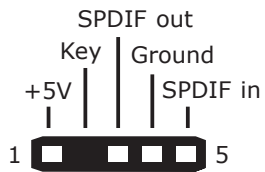
Configure the onboard audio in the Chipset menu (“South Bridge” submenu) of the BIOS. Refer to chapter 3 for more information.

Driver Installation

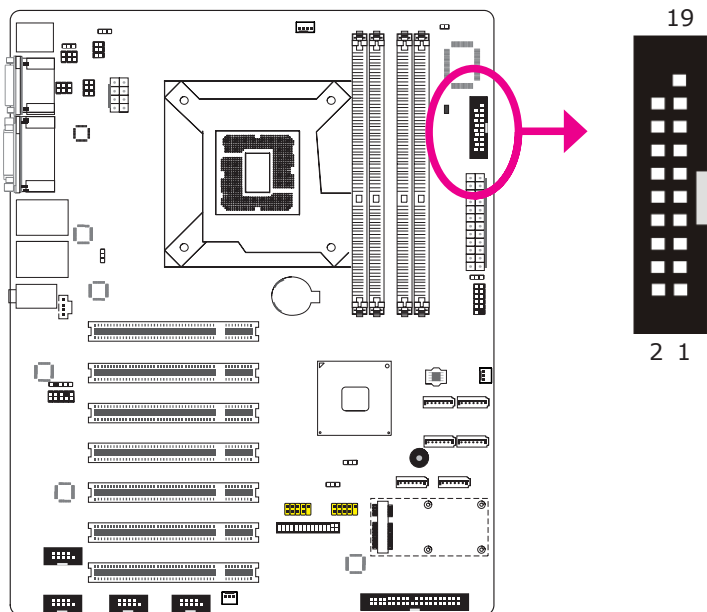
Install the audio driver. Refer to chapter 4 for more information.



The CD-in connector is used to receive audio from a CD-ROM drive, TV tuner or MPEG card.



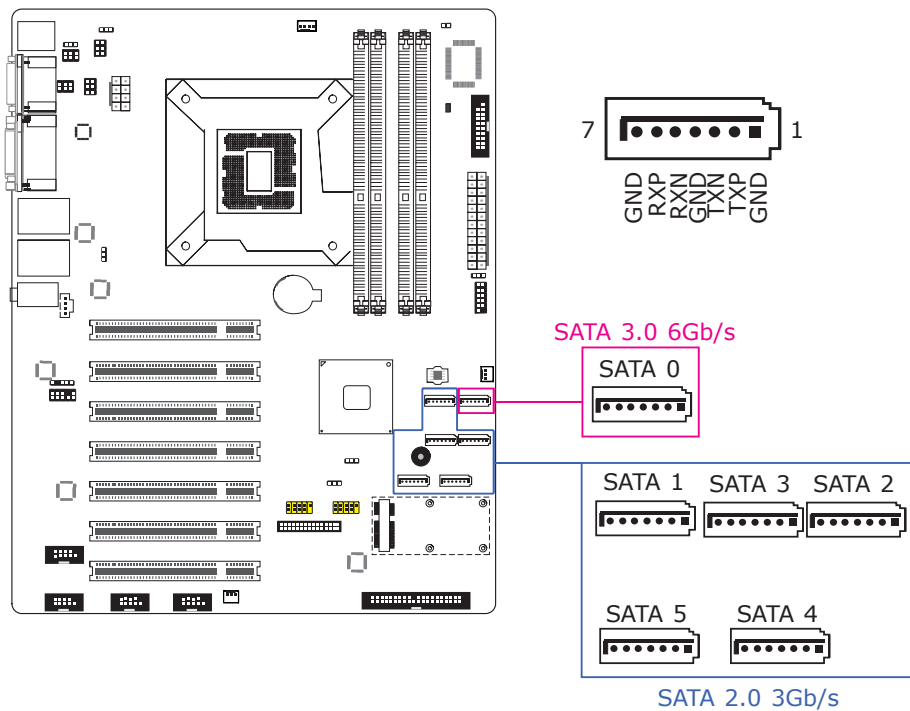
The S/PDIF connector is used to connect an external S/PDIF port. Your S/PDIF port may be mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then connect the audio cable to the S/PDIF connector. Make sure pin 1 of the audio cable is aligned with pin 1 of the S/PDIF connector.



The 8-bit Digital I/O connector provides powering-on function to external devices that are connected to these connectors.

Pin	Pin Assignment	Pin	Pin Assignment
1	GND	2	+12V
3	DIO7	4	+12V
5	DIO6	6	GND
7	DIO5	8	VCC
9	DIO4	10	VCC
11	DIO3	12	GND
13	DIO2	14	V_5P0_STBY
15	DIO1	16	V_5P0_STBY
17	DIO0	18	GND
19	GND		

SATA (Serial ATA) Connectors



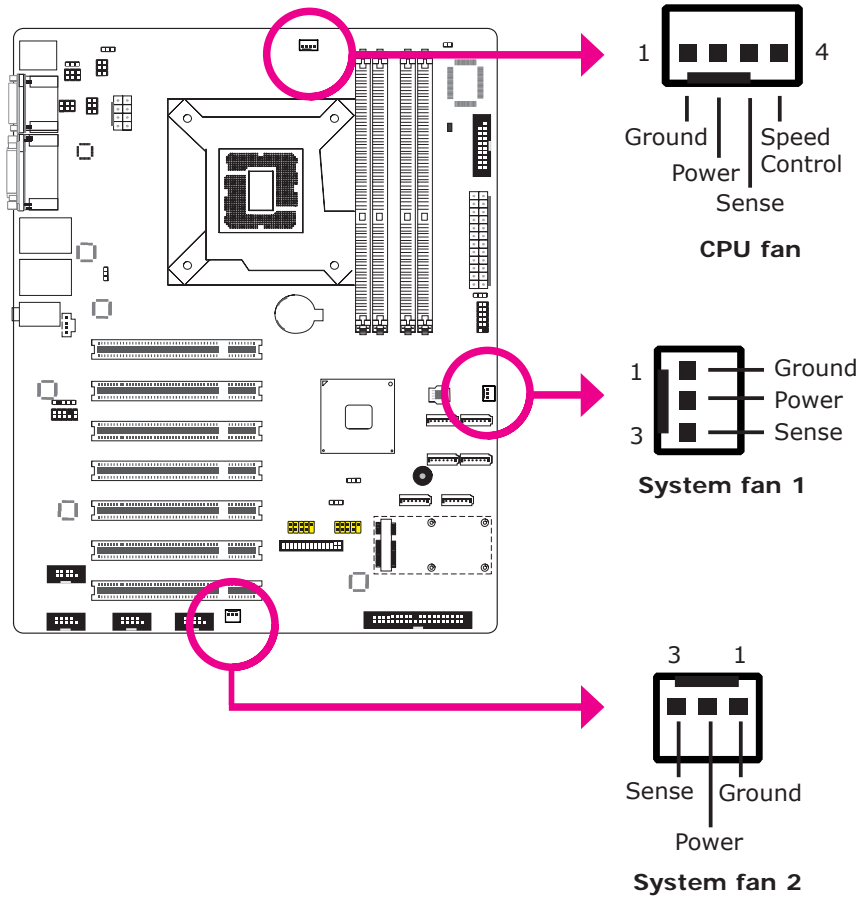
Features

- SATA 0 supports data transfer rate up to 6Gb/s
- SATA 1 to SATA 5 support data transfer rate up to 3Gb/s
- Integrated Advanced Host Controller Interface (AHCI) controller

The Serial ATA connectors are used to connect Serial ATA devices. Connect one end of the Serial ATA cable to a SATA connector and the other end to your Serial ATA device.

BIOS Setting

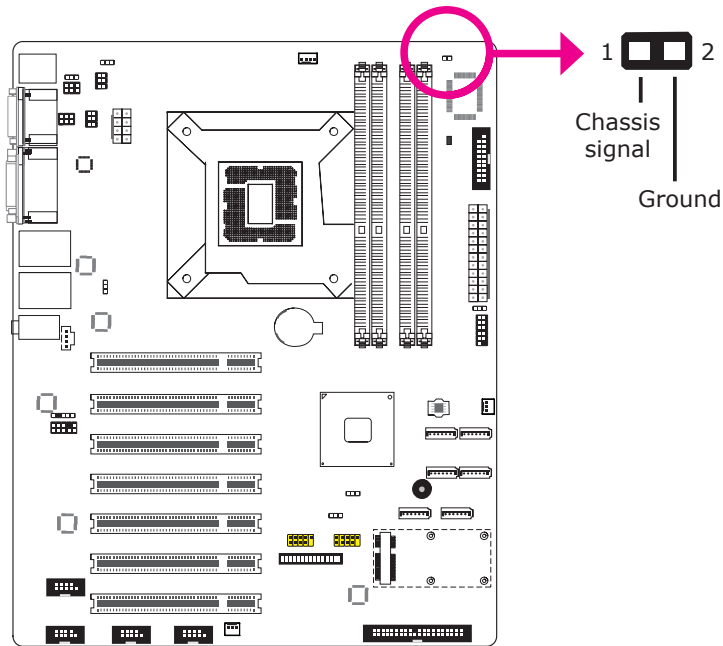
Configure the Serial ATA drives in the Advanced menu ("IDE Configuration" sub-menu) of the BIOS. Refer to chapter 3 for more information.



The fan connectors are used to connect cooling fans. The cooling fans will provide adequate airflow throughout the chassis to prevent overheating the CPU and system board components.

BIOS Setting

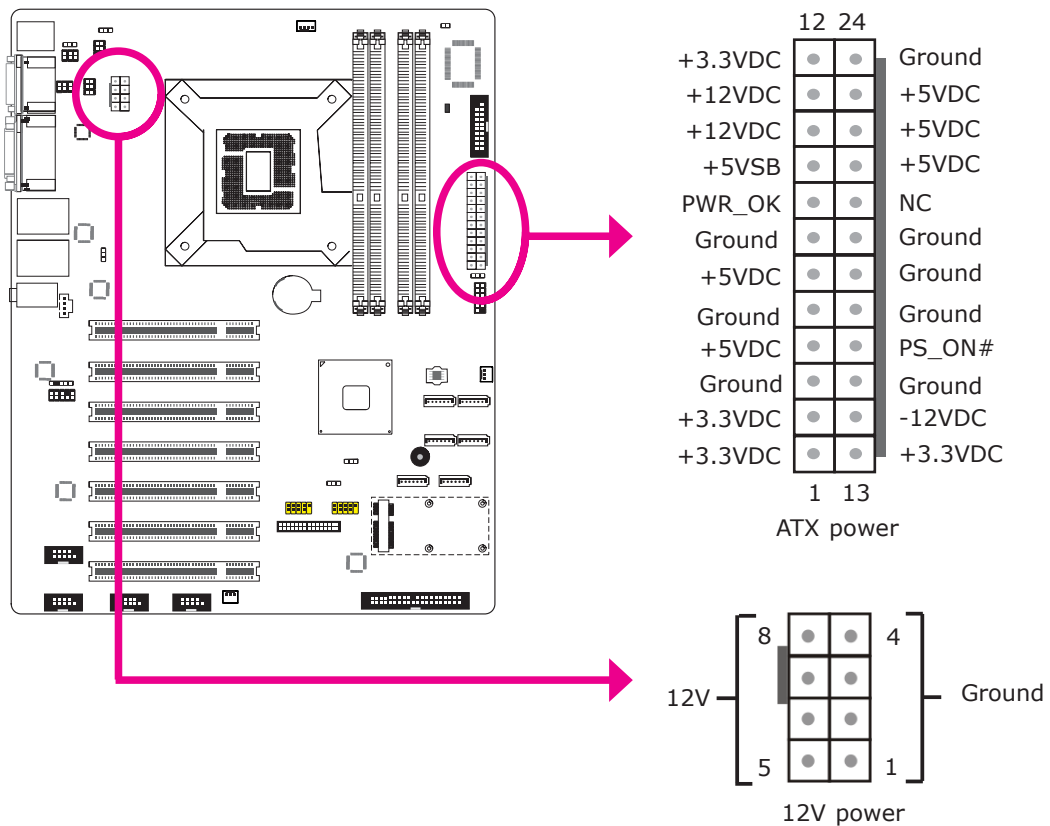
The Advanced menu ("Hardware Health Configuration" submenu) of the BIOS will display the current speed of the cooling fans. Refer to chapter 3 for more information.



The board supports the chassis intrusion detection function. Connect the chassis intrusion sensor cable from the chassis to this connector. When the system's power is on and a chassis intrusion occurred, an alarm will sound. When the system's power is off and a chassis intrusion occurred, the alarm will sound only when the system restarts.

MyGuard Hardware Monitor

Install the "MyGuard Hardware Monitor" utility. By default, the chassis intrusion detection function is disabled. When enabled, a warning message will appear when the chassis is open. The utility can also be configured so that a beeping alarm will sound when the chassis is open. Refer to the "MyGuard Hardware Monitor" section in chapter 4 for more information.



Use a power supply that complies with the ATX12V Power Supply Design Guide Version 1.1. An ATX12V power supply unit has a standard 24-pin ATX main power connector that must be inserted into the 24-pin connector. The 8-pin +12V power connector enables the delivery of more +12VDC current to the processor's Voltage Regulator Module (VRM).

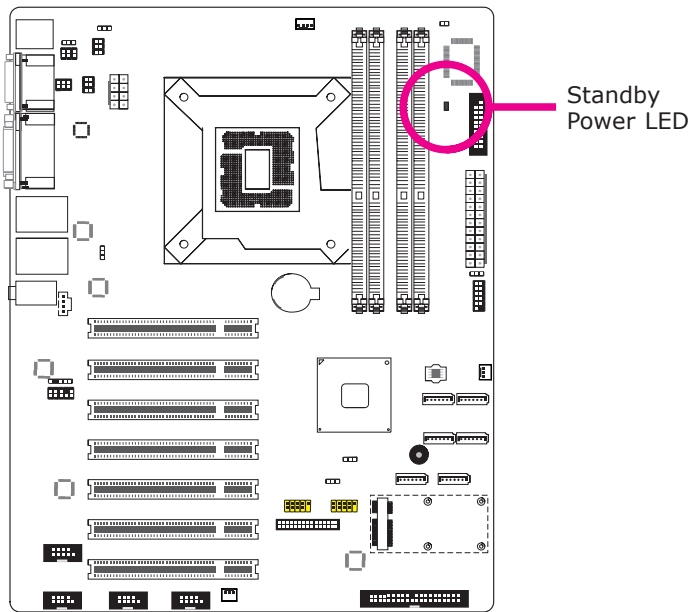
The power connectors from the power supply unit are designed to fit the 24-pin and 8-pin connectors in only one orientation. Make sure to find the proper orientation before plugging the connectors.

The system board requires a minimum of 300 Watt power supply to operate. Your system configuration (CPU power, amount of memory, add-in cards, peripherals, etc.) may exceed the minimum power requirement. To ensure that adequate power is provided, we strongly recommend that you use a minimum of 400 Watt (or greater) power supply.

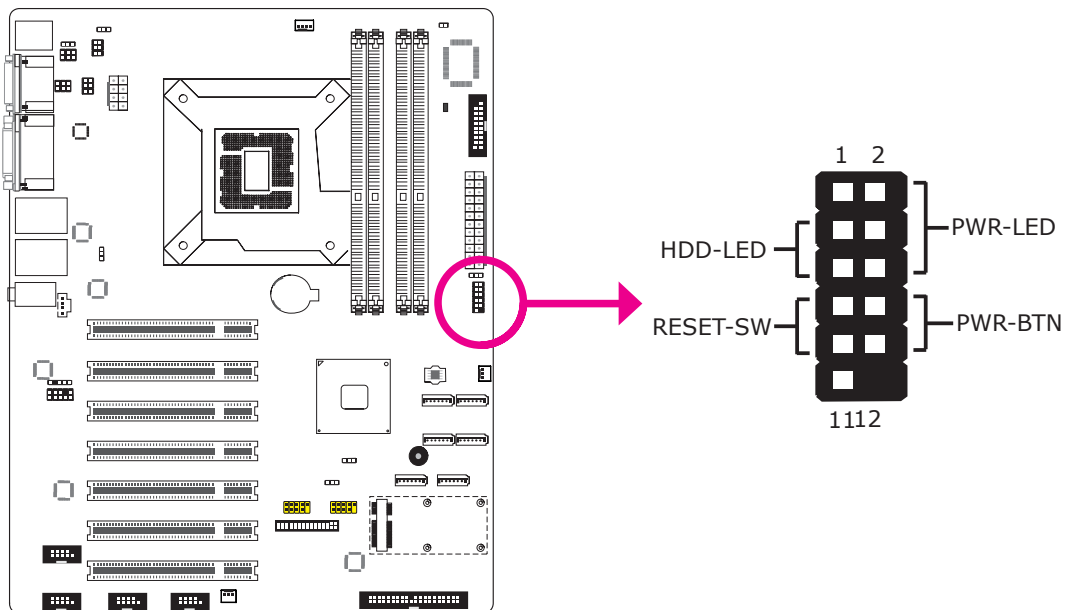


Important:

Insufficient power supplied to the system may result in instability or the add-in boards and peripherals not functioning properly. Calculating the system's approximate power usage is important to ensure that the power supply meets the system's consumption requirements.



This LED will light red when the system is in the standby mode. It indicates that there is power on the system board. Power-off the PC and then unplug the power cord prior to installing any devices. Failure to do so will cause severe damage to the motherboard and components.



This LED will light when the hard drive is being accessed.

RESET SW - Reset Switch

This switch allows you to reboot without having to power off the system.

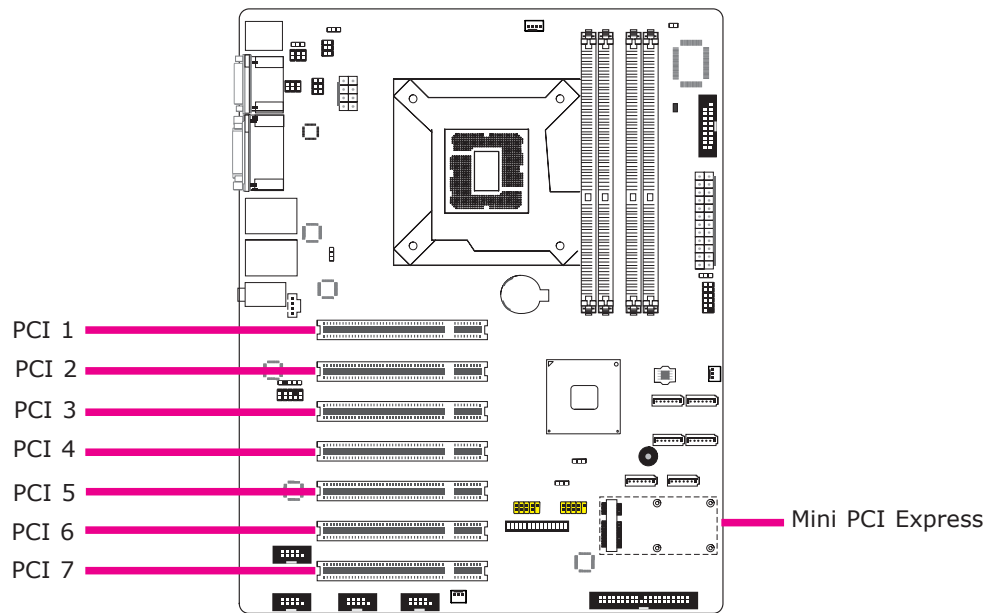
PWR-BTN - Power Switch

This switch is used to power on or off the system.

PWR-LED - Power/Standby LED

When the system's power is on, this LED will light. When the system is in the S1 (POS - Power On Suspend) state, it will blink every second. When the system is in the S3 (STR - Suspend To RAM) state, it will blink every 4 seconds.

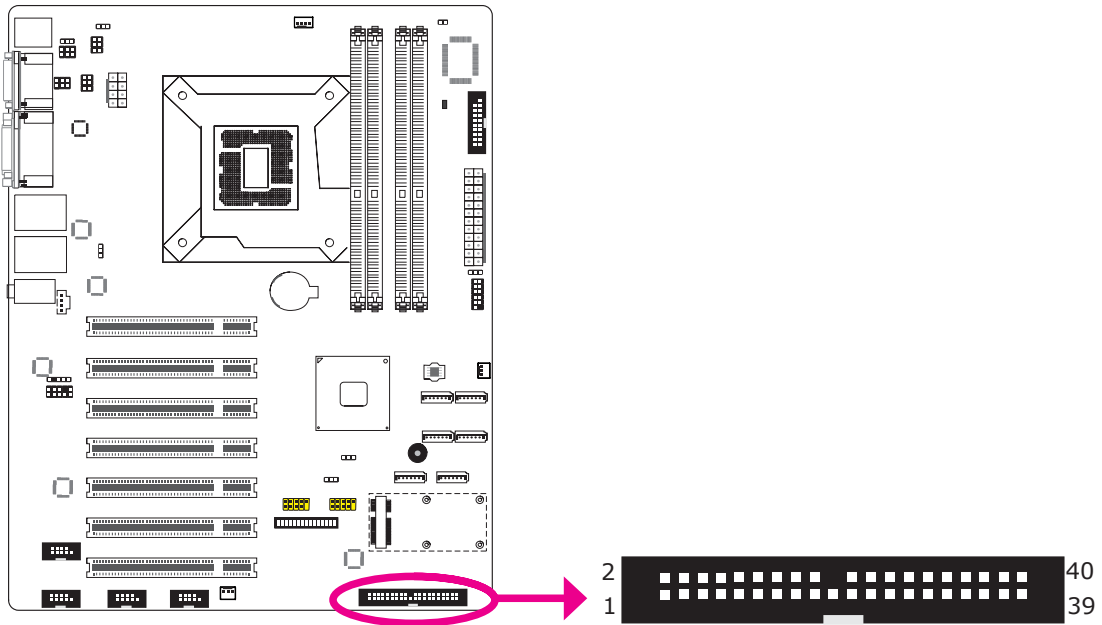
	Pin	Pin Assignment		Pin	Pin Assignment
HDD-LED	3	HDD Power	PWR-LED	2	LED Power
	5	Signal		4	LED Power
RESET SW	7	Ground		6	Signal
	9	RST Signal	PWR-BTN	8	Ground
	11	N.C.		10	Signal



The PCI slot supports expansion cards that comply with PCI specifications.

Mini PCI Express Slot

Install mini PCI Express cards such as network cards or other cards that comply to the mini PCI Express specifications into the mini PCI Express x1 slot.



The IDE connector is used to connect hard drives. The connector on the IDE cable can be inserted into this connector only if pin 1 of the cable is aligned with pin 1 of this connector.

The IDE connector supports 2 devices, a Master and a Slave. Use an IDE ribbon cable to connect the drives to the system board. An IDE ribbon cable has 3 connectors on them, one that plugs into the IDE connector on the system board and the other 2 connects to IDE devices. The connector at the end of the cable is for the Master drive and the connector in the middle of the cable is for the Slave drive.



Note:

Refer to your disk drive user's manual for information about selecting proper drive switch settings.

Adding a Second IDE Disk Drive

When using two IDE drives, one must be set as the master and the other as the slave. Follow the instructions provided by the drive manufacturer for setting the jumpers and/or switches on the drives.

The system board supports Enhanced IDE or ATA-2, ATA/33, ATA/66, ATA/100 and ATA/133 hard drives. We recommend that you use hard drives from the same manufacturer. In a few cases, drives from two different manufacturers will not function properly when used together. The problem lies in the hard drives, not the system board.

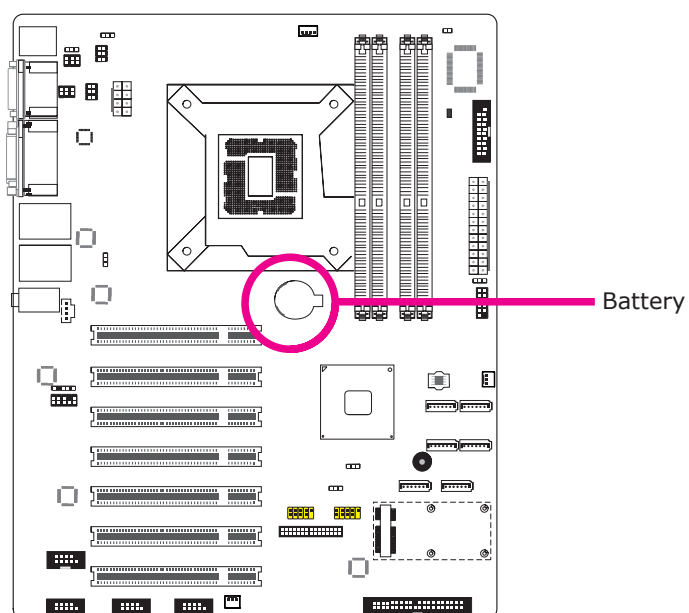
**Important:**

If you encountered problems while using an ATAPI CD-ROM drive that is set in Master mode, please set the CD-ROM drive to Slave mode. Some ATAPI CD-ROMs may not be recognized and cannot be used if incorrectly set in Master mode.

BIOS Setting

Configure the onboard IDE in the Integrated Peripherals submenu ("OnChip IDE Device" section) of the BIOS. Refer to chapter 3 for more information.

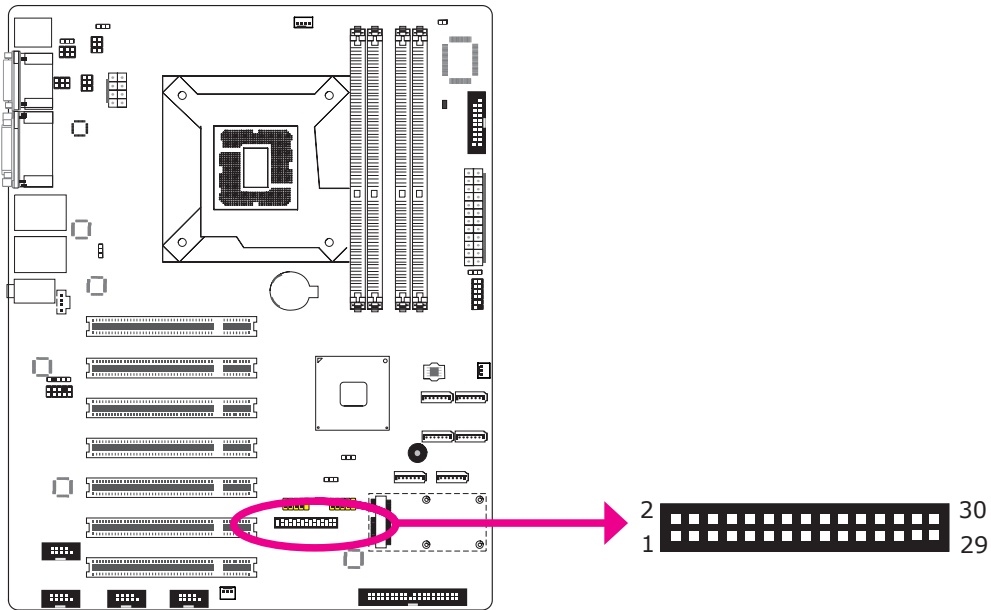
Battery



The lithium ion battery powers the real-time clock and CMOS memory. It is an auxiliary source of power when the main power is shut off.



Safety Measures

- Danger of explosion if battery incorrectly replaced.
- Replace only with the same or equivalent type recommend by the manufacturer.
- Dispose of used batteries according to local ordinance.



The SDVO connector is used to connect the optional SDVO-LVDS daughterboard.

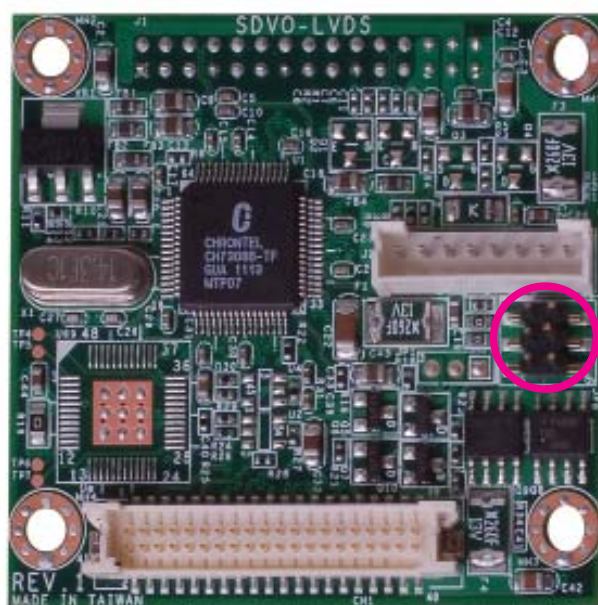
Pin	Pin Assignment	Pin	Pin Assignment
1	Ground	2	DPB_AUXP
3	DPB_LANE0_P	4	DPB_AUXN
5	DPB_LANE0_N	6	SDVO_STALLP
7	Ground	8	SDVO_STALLN
9	DPB_LANE1_P	10	SDVO_INTP
11	DPB_LANE1_N	12	SDVO_INTN
13	Ground	14	PCIE_RST
15	DPB_LANE2_P	16	DPB_CTRLCLK
17	DPB_LANE2_N	18	DPB_CTRLDATA
19	Ground	20	DPB_HPD
21	DPB_LANE3_P	22	GPIO/SMCLK
23	DPB_LANE3_N	24	GPIO/SMBDATA/L_BKLTCTL
25	+3V3	26	+3V3
27	+5V	28	+5V
29	+12V	30	+12V

- 
- 
- Chrontel CH7308B
 - Supports 18/24-bit 1600x1200 LVDS panel (default 1024x768)
 - 1 LVDS LCD panel connector
 - 1 LCD/Inverter power connector
 - SDVO interface
 - Supports dimming control via hot keys

Dimensions

- 45mm (1.77") x 38mm (1.49")

Jumper Settings



1 2
3 4
5 6
1-2 On: +12V

1 2
3 4
5 6
3-4 On: +5V

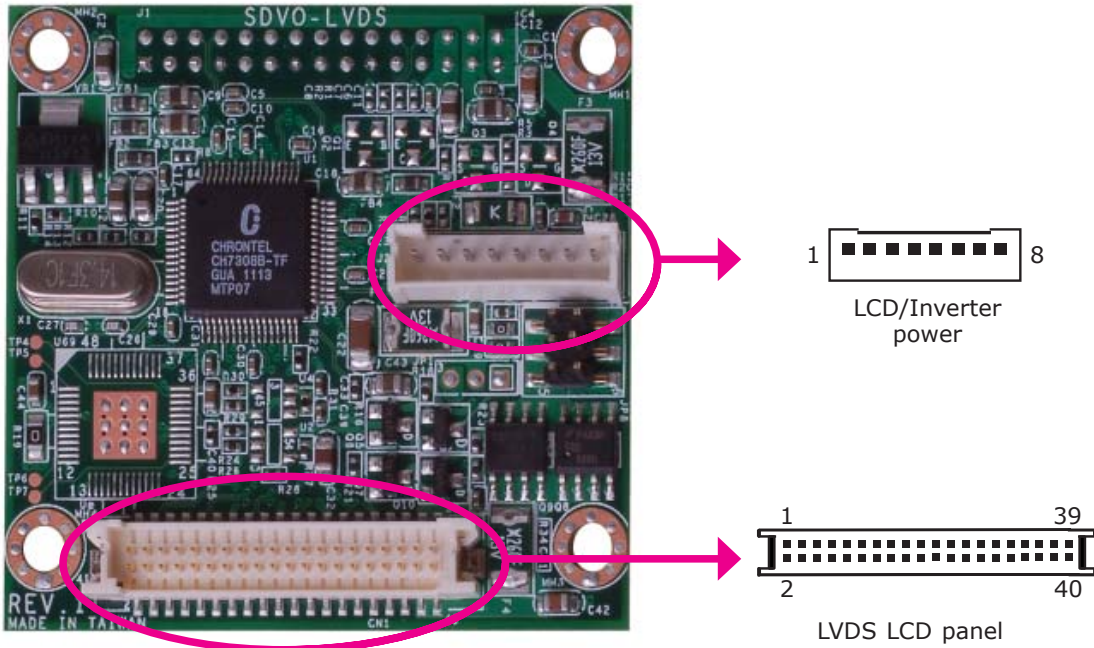
1 2
3 4
5 6
5-6 On: +3.3V
(default)

JP8 is used to select the power supplied to the LCD panel.



Important:

Before powering-on the system, make sure JP8's setting matches the LCD panel's specification. Selecting the incorrect voltage will seriously damage the LCD panel.



The system board allows you to connect a LCD Display Panel by means of the LVDS LCD panel connector and the LCD/Inverter power connector. These connectors transmit video signals and power from the system board to the LCD Display Panel.

LVDS LCD Panel Connector

Pins	Function	Pins	Function
1	GND	2	GND
3	N. C.	4	N. C.
5	N. C.	6	N. C.
7	GND	8	GND
9	LVDS_Out2+	10	LVDS_Out6+
11	LVDS_Out2-	12	LVDS_Out6-
13	GND	14	GND
15	LVDS_Out1+	16	LVDS_Out5+
17	LVDS_Out1-	18	LVDS_Out5-
19	GND	20	GND
21	LVDS_Out0+	22	LVDS_Out4+
23	LVDS_Out0-	24	LVDS_Out4-
25	GND	26	GND
27	LVDS_CLK1+	28	LVDS_CLK2+
29	LVDS_CLK1-	30	LVDS_CLK2-
31	GND	32	GND
33	LVDS_DDCCLK	34	N. C.
35	LVDS_DDCDAA	36	N. C.
37	Panel Power	38	Panel Power
39	Panel Power	40	Panel Power

LCD/Inverter Power Connector

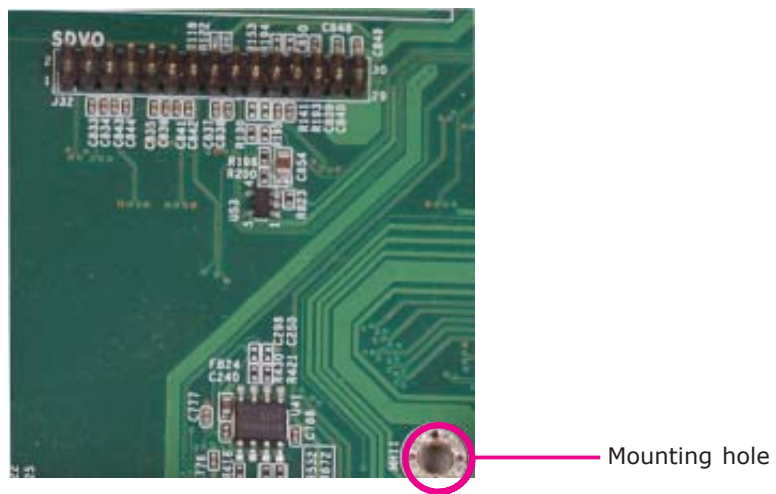
Pins	Function
1	GND
2	GND
3	Panel Inverter Brightness Voltage Control
4	Panel Power
5	+3.3V
6	Panel Backlight On/Off Control
7	+12V
8	+12V



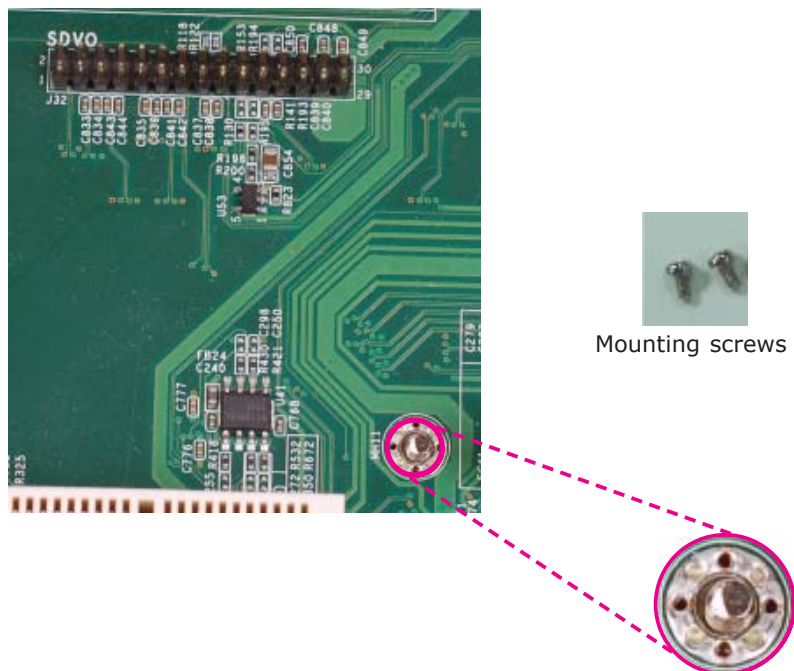
Important:

The motherboard used in this section is for reference purpose only and may not resemble your motherboard. These illustrations are mainly to guide you on how to install SDVO-LVDS onto the motherboard of your choice.

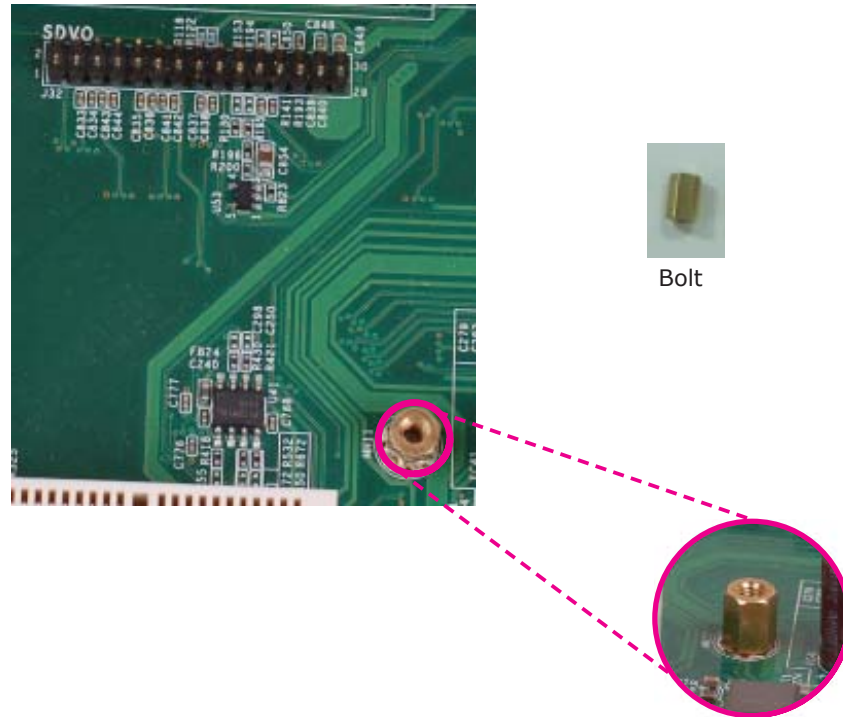
1. The photo below shows the location of the mounting hole on the motherboard.



2. Insert the provided mounting screws into the mounting hole - from the bottom through the top of the motherboard.

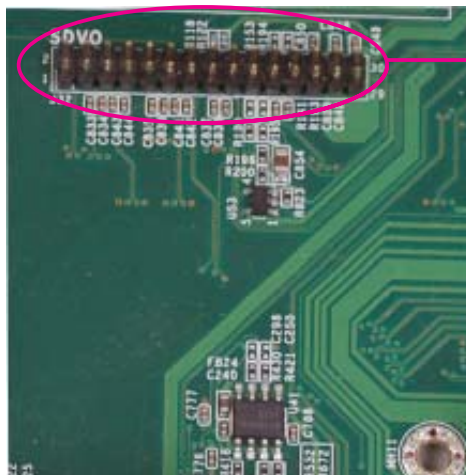


3. While supporting the mounting screw at the bottom, from the top side of the board, fasten a bolt into the screw.



4. The SDVO connector is located at the bottom of the daughterboard. Grasping SDVO-LVDS by its edges, position it on top of the motherboard's SDVO connector with its mounting holes aligned with the bolts on the motherboard. This will also align the SDVO connector of the two boards to each other.





SDVO connector on the motherboard

5. Press SDVO-LVDS down firmly until it is completely seated on the SDVO connector of the motherboard.



SDVO-LVDS

Motherboard

6. Use the provided mounting screws to secure SDVO-LVDS to the motherboard.



Mounting screw